

9/980376

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF THE RECORDING
OF A CHANGE

(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

To:

STYLE, Kelda, Camilla, Karen
Page White & Farrer
54 Doughty Street
London WC1N 2LS
ROYAUME-UNI

Date of mailing (day/month/year) 24 January 2002 (24.01.02)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 101636/KS/JJ	
International application No. PCT/EP00/04231	International filing date (day/month/year) 09 May 2000 (09.05.00)

1. The following indications appeared on record concerning:		
<input checked="" type="checkbox"/> the applicant	<input type="checkbox"/> the inventor	<input type="checkbox"/> the agent
<input type="checkbox"/> the common representative		
Name and Address NOKIA NETWORKS OY Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:		
<input type="checkbox"/> the person	<input checked="" type="checkbox"/> the name	<input type="checkbox"/> the address
<input type="checkbox"/> the nationality		
<input type="checkbox"/> the residence		
Name and Address NOKIA CORPORATION Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
3. Further observations, if necessary: Change in the applicant's name due to a merger has been recorded.		
4. A copy of this notification has been sent to:		
<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned	
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned	
<input type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:	

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Anne KARKACHI
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

Date of mailing (day/month/year) 12 January 2001 (12.01.01)	
International application No. PCT/EP00/04231	Applicant's or agent's file reference 101636/KS/JJ
International filing date (day/month/year) 09 May 2000 (09.05.00)	Priority date (day/month/year) 04 June 1999 (04.06.99)
Applicant HAUMONT, Serge et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 03 October 2000 (03.10.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer R. E. Stoffel Telephone No.: (41-22) 338.83.38
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PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 101636/KS/JJ	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 00/ 04231	International filing date (day/month/year) 09/05/2000	(Earliest) Priority Date (day/month/year) 04/06/1999
Applicant NOKIA NETWORKS OY		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

RELEASING A CONNECTION IN A WIRELESS COMMUNICATION NETWORK

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

2a _____

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP 00/04231

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

Line 1: "... (10a), such as a radio network controller, for use..."

Line 1: "... communication network (e.g. UMTS), said..."

Line 3: "... element (14), for example an SGSN, wherein..."

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/04231

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 568 212 A (NOKIA MOBILE PHONES LTD) 3 November 1993 (1993-11-03)	1-3, 16, 17, 19, 20
Y	column 4, line 34 -column 5, line 28 ---	4
Y	EP 0 888 022 A (LUCENT TECHNOLOGIES INC) 30 December 1998 (1998-12-30)	4
	column 8, line 52 -column 9, line 58 ---	
A	WO 95 08898 A (NOKIA TELECOMMUNICATIONS OY ;MUSZYNSKI PETER (FI)) 30 March 1995 (1995-03-30) page 15, line 5 - line 35 ---	1-4, 16, 17, 19, 20
	--- -/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

15 August 2000

Date of mailing of the international search report

22/08/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Schut, G

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/04231

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0568212	A	03-11-1993	FI 921882 A	28-10-1993
			DE 69313913 D	23-10-1997
			DE 69313913 T	05-03-1998
			JP 2994527 B	27-12-1999
			JP 6022364 A	28-01-1994
			US 5345448 A	06-09-1994
EP 0888022	A	30-12-1998	CA 2235669 A	24-12-1998
			JP 11103487 A	13-04-1999
			NO 982919 A	28-12-1998
			CA 2235688 A	24-12-1998
			CA 2235876 A	24-12-1998
			CA 2235870 A	24-12-1998
WO 9508898	A	30-03-1995	AU 684719 B	08-01-1998
			AU 4821093 A	10-04-1995
			EP 0720804 A	10-07-1996
			FI 961315 A	21-05-1996
			JP 9505949 T	10-06-1997
			NO 961193 A	22-05-1996
			US 5850607 A	15-12-1998
WO 9927741	A	03-06-1999	AU 1448299 A	15-06-1999
GB 2313259	A	19-11-1997	NONE	
EP 0898438	A	24-02-1999	FI 973425 A	21-02-1999
			AU 7045198 A	08-03-1999
			FI 990988 A	30-04-1999
			WO 9909774 A	25-02-1999
			JP 11113071 A	23-04-1999

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/04231

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 27741 A (ERICSSON TELEFON AB L M) 3 June 1999 (1999-06-03) page 14, line 18 - line 23 page 20, line 20 -page 22, line 10 page 24, line 9 - line 21 page 28, line 7 -page 30, line 21; figures 9,14	1-5,13, 16-19,22
A	--- GB 2 313 259 A (MOTOROLA ISRAEL LTD) 19 November 1997 (1997-11-19) abstract	9
A	--- EP 0 898 438 A (NOKIA MOBILE PHONES LTD) 24 February 1999 (1999-02-24) -----	

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

09/980376

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum) 101636/KS/JJ

Box No. I TITLE OF INVENTION

A NETWORK ELEMENT

Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

Nokia Networks Oy
Keilalahdentie 4
FIN-02150 ESPOO
Finland

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (that is, country) of nationality:

Finland

State (that is, country) of residence:

Finland

This person is applicant
for the purposes of:

☐ all designated
States

☒ all designated States except
the United States of America

☐ the United States
of America only

☐ the States indicated in
the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

HAUMONT, Serge
Riistavuorenkuja 3 B As. 10
FIN-00320 Helsinki
Finland

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box
is marked, do not fill in below.)

State (that is, country) of nationality:

Finland

State (that is, country) of residence:

Finland

This person is applicant
for the purposes of:

☐ all designated
States

☐ all designated States except
the United States of America

☒ the United States
of America only

☐ the States indicated in
the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf
of the applicant(s) before the competent International Authorities as:

☐ agent

☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

STYLE, Kelda Camilla Karen
Page White & Farrer
54 Doughty Street
London WC1N 2LS
United Kingdom

Telephone No.

020 7831-7929

Facsimile No.

020 7831-8040

Teleprinter No.

8955681

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

AHMAVAARA, Kalle
Hakaniemenranta 18 D 62
FIN-00530 Helsinki
Finland

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

Finland

State (that is, country) of residence:

Finland

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only
☐ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only
☐ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only
☐ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☒ AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | |
|--|--|
| <input checked="" type="checkbox"/> AE United Arab Emirates | <input checked="" type="checkbox"/> LR Liberia |
| <input checked="" type="checkbox"/> AL Albania | <input checked="" type="checkbox"/> LS Lesotho |
| <input checked="" type="checkbox"/> AM Armenia | <input checked="" type="checkbox"/> LT Lithuania |
| <input checked="" type="checkbox"/> AT Austria | <input checked="" type="checkbox"/> LU Luxembourg |
| <input checked="" type="checkbox"/> AU Australia | <input checked="" type="checkbox"/> LV Latvia |
| <input checked="" type="checkbox"/> AZ Azerbaijan | <input checked="" type="checkbox"/> MA Morocco |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina | <input checked="" type="checkbox"/> MD Republic of Moldova |
| <input checked="" type="checkbox"/> BB Barbados | <input checked="" type="checkbox"/> MG Madagascar |
| <input checked="" type="checkbox"/> BG Bulgaria | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BR Brazil | |
| <input checked="" type="checkbox"/> BY Belarus | <input checked="" type="checkbox"/> MN Mongolia |
| <input checked="" type="checkbox"/> CA Canada | <input checked="" type="checkbox"/> MW Malawi |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> MX Mexico |
| <input checked="" type="checkbox"/> CN China | <input checked="" type="checkbox"/> NO Norway |
| <input checked="" type="checkbox"/> CR Costa Rica | <input checked="" type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CU Cuba | <input checked="" type="checkbox"/> PL Poland |
| <input checked="" type="checkbox"/> CZ Czech Republic | <input checked="" type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> DE Germany | <input checked="" type="checkbox"/> RO Romania |
| <input checked="" type="checkbox"/> DK Denmark | <input checked="" type="checkbox"/> RU Russian Federation |
| <input checked="" type="checkbox"/> DM Dominica | <input checked="" type="checkbox"/> SD Sudan |
| <input checked="" type="checkbox"/> EE Estonia | <input checked="" type="checkbox"/> SE Sweden |
| <input checked="" type="checkbox"/> ES Spain | <input checked="" type="checkbox"/> SG Singapore |
| <input checked="" type="checkbox"/> FI Finland | <input checked="" type="checkbox"/> SI Slovenia |
| <input checked="" type="checkbox"/> GB United Kingdom | <input checked="" type="checkbox"/> SK Slovakia |
| <input checked="" type="checkbox"/> GD Grenada | <input checked="" type="checkbox"/> SL Sierra Leone |
| <input checked="" type="checkbox"/> GE Georgia | <input checked="" type="checkbox"/> TJ Tajikistan |
| <input checked="" type="checkbox"/> GH Ghana | <input checked="" type="checkbox"/> TM Turkmenistan |
| <input checked="" type="checkbox"/> GM Gambia | <input checked="" type="checkbox"/> TR Turkey |
| <input checked="" type="checkbox"/> HR Croatia | <input checked="" type="checkbox"/> TT Trinidad and Tobago |
| <input checked="" type="checkbox"/> HU Hungary | <input checked="" type="checkbox"/> TZ United Republic of Tanzania |
| <input checked="" type="checkbox"/> ID Indonesia | <input checked="" type="checkbox"/> UA Ukraine |
| <input checked="" type="checkbox"/> IL Israel | <input checked="" type="checkbox"/> UG Uganda |
| <input checked="" type="checkbox"/> IN India | <input checked="" type="checkbox"/> US United States of America |
| <input checked="" type="checkbox"/> IS Iceland | |
| <input checked="" type="checkbox"/> JP Japan | <input checked="" type="checkbox"/> UZ Uzbekistan |
| <input checked="" type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> VN Viet Nam |
| <input checked="" type="checkbox"/> KG Kyrgyzstan | <input checked="" type="checkbox"/> YU Yugoslavia |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | <input checked="" type="checkbox"/> ZA South Africa |
| | <input checked="" type="checkbox"/> ZW Zimbabwe |
| <input checked="" type="checkbox"/> KR Republic of Korea | |
| <input checked="" type="checkbox"/> KZ Kazakhstan | |
| <input checked="" type="checkbox"/> LC Saint Lucia | |
| <input checked="" type="checkbox"/> LK Sri Lanka | |

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:

- ☒ Republic of Seychelles
- ☒ Antigua & Barbuda
- ☒ People's Democratic Republic of Algeria

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

Supplemental Box

If the Supplemental Box is not used, this sheet should not be included in the request.

1. *If, in any of the Boxes, the space is insufficient to furnish all the information: in such case, write "Continuation of Box No. ..." [indicate the number of the Box] and furnish the information in the same manner as required according to the captions of the Box in which the space was insufficient, in particular:*
 - (i) *if more than two persons are involved as applicants and/or inventors and no "continuation sheet" is available: in such case, write "Continuation of Box No. III" and indicate for each additional person the same type of information as required in Box No. III. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below;*
 - (ii) *if, in Box No. II or in any of the sub-boxes of Box No. III, the indication "the States indicated in the Supplemental Box" is checked: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the applicant(s) involved and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is applicant;*
 - (iii) *if, in Box No. II or in any of the sub-boxes of Box No. III, the inventor or the inventor/applicant is not inventor for the purposes of all designated States or for the purposes of the United States of America: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the inventor(s) and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is inventor;*
 - (iv) *if, in addition to the agent(s) indicated in Box No. IV, there are further agents: in such case, write "Continuation of Box No. IV" and indicate for each further agent the same type of information as required in Box No. IV;*
 - (v) *if, in Box No. V, the name of any State (or OAPI) is accompanied by the indication "patent of addition," or "certificate of addition," or if, in Box No. V, the name of the United States of America is accompanied by an indication "continuation" or "continuation-in-part": in such case, write "Continuation of Box No. V" and the name of each State involved (or OAPI), and after the name of each such State (or OAPI), the number of the parent title or parent application and the date of grant of the parent title or filing of the parent application;*
 - (vi) *if, in Box No. VI, there are more than three earlier applications whose priority is claimed: in such case, write "Continuation of Box No. VI" and indicate for each additional earlier application the same type of information as required in Box No. VI;*
 - (vii) *if, in Box No. VI, the earlier application is an ARIPO application: in such case, write "Continuation of Box No. VI", specify the number of the item corresponding to that earlier application and indicate at least one country party to the Paris Convention for the Protection of Industrial Property or one Member of the World Trade Organization for which that earlier application was filed.*
2. *If, with regard to the precautionary designation statement contained in Box No. V, the applicant wishes to exclude any State(s) from the scope of that statement: in such case, write "Designation(s) excluded from precautionary designation statement" and indicate the name or two-letter code of each State so excluded.*
3. *If the applicant claims, in respect of any designated Office, the benefits of provisions of the national law concerning non-prejudicial disclosures or exceptions to lack of novelty: in such case, write "Statement concerning non-prejudicial disclosures or exceptions to lack of novelty" and furnish that statement below.*

Continuation of Box IV

Agents continues

PALMER, ROGER (GB)
 RICHARDS, DAVID JOHN (GB)
 PENDLEBURY, ANTHONY (GB)
 JENKINS, PETER DAVID (GB)
 DRIVER, VIRGINIA ROZANNE (GB)
 DANIELS, JEFFERY NICHOLAS (GB)
 NEOBARD, WILLIAM JOHN (GB)
 SHACKLETON, NICOLA (GB)
 SLINGSBY, PHILIP ROY (GB)
 HILL, CHRISTOPHER MICHAEL (GB)
 RUUSKANEN, JUHA-PEKKA (FIN)

ALL OF: PAGE WHITE & FARRER
 54 Doughty Street
 London WC1N 2LS
 United Kingdom

Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application:* regional Office	international application: receiving Office
item (1) 04/06/99	9913092.4	GB		
item (2)				
item (3)				

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): _____

* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY			
Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):		Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):	
ISA/EP		Date (day/month/year) 26.11.99	Number RS 103389 Country (or regional Office) EP

Box No. VIII CHECK LIST; LANGUAGE OF FILING	
This international application contains the following number of sheets: request : 5 description (excluding sequence listing part) : 15 claims : 3 abstract : 1 drawings : 3 sequence listing part of description : _____ Total number of sheets : 27	This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input type="checkbox"/> separate signed power of attorney 3. <input checked="" type="checkbox"/> copy of general power of attorney; reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input type="checkbox"/> other (specify):
Figure of the drawings which should accompany the abstract: 2a	Language of filing of the international application: English

Box No. IX SIGNATURE OF APPLICANT OR AGENT	
<small>Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).</small>	
KELDA CAMILLA KAREN STYLE.....(Agent)	

For receiving Office use only	
1. Date of actual receipt of the purported international application:	2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:	
4. Date of timely receipt of the required corrections under PCT Article 11(2):	
5. International Searching Authority (if two or more are competent): ISA/	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.

For International Bureau use only	
Date of receipt of the record copy by the International Bureau:	

PCT

**NOTICE INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION TO THE DESIGNATED OFFICES**

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

STYLE, Kelda, Camilla, Karen
Page White & Farrer
54 Doughty Street
London WC1N 2LS
ROYAUME-UNI

RECEIVED

21 DEC 2000

Date of mailing (day/month/year) 14 December 2000 (14.12.00)		
Applicant's or agent's file reference 101636/KS/JJ		
IMPORTANT NOTICE		
International application No. PCT/EP00/04231	International filing date (day/month/year) 09 May 2000 (09.05.00)	Priority date (day/month/year) 04 June 1999 (04.06.99)
Applicant NOKIA NETWORKS OY et al		

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
AG,AU,DZ,KP,KR,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,CA,CH,CN,CR,CU,CZ,DE,DK,DM,EA,EE,EP,ES,FI,GB,GD,GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,MN,MW,MX,NO,NZ,OA,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,ZA,ZW

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 14 December 2000 (14.12.00) under No. WO 00/76243

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer J. Zahra Telephone No. (41-22) 338.83.38
--	---

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ _____

PCT

CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only

Identification of IPEA		Date of receipt of DEMAND
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference 101636/KCS/DG
International application No. PCT/EP00/04231	International filing date (day/month/year) 09.05.00	(Earliest) Priority date (day/month/year) 04.06.99
Title of invention A NETWORK ELEMENT		
Box No. II APPLICANT(S)		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) NOKIA NETWORKS OY KEILALAHDENTIE 4 FIN-02150 ESPOO FINLAND		Telephone No.:
		Facsimile No.:
		Teleprinter No.:
State (that is, country) of nationality: FINLAND		State (that is, country) of residence: FINLAND
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) HAUMONT, SERGE RIISTAVUORENKUJA 3 B AS. 10 FIN-00320 HELSINKI FINLAND		
State (that is, country) of nationality: FINLAND		State (that is, country) of residence: FINLAND
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) AHMAVAARA, KALLE HAKANIEMENRANTA 18 D 62 FIN-00530 HELSINKI FINLAND		
State (that is, country) of nationality: FINLAND		State (that is, country) of residence: FINLAND
<input type="checkbox"/> Further applicants are indicated on a continuation sheet.		

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCEThe following person is ☒ agent ☐ common representativeand ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*KELDA STYLE
PAGE WHITE & FARRER
54 Doughty Street
London WC1N 2LS
United Kingdom

Telephone No.:

020 7831-7929

Facsimile No.:

020 7831-8040

Teleprinter No.:

8955681

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION****Statement concerning amendments:***

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filedthe description ☐ as originally filed
☐ as amended under Article 34the claims ☐ as originally filed
☐ as amended under Article 19 (together with any accompanying statement)
☐ as amended under Article 34the drawings ☐ as originally filed
☐ as amended under Article 342. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English☒ which is the language in which the international application was filed.☐ which is the language of a translation furnished for the purposes of international search.☐ which is the language of publication of the international application.☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.**Box No. V ELECTION OF STATES**The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes not to elect:

Sheet No. 3

International application No.
PCT/EP00/04231

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- | | | |
|--|---|--------|
| 1. translation of international application | : | sheets |
| 2. amendments under Article 34 | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | sheets |
| 5. letter | : | sheets |
| 6. other (<i>specify</i>) | : | sheets |

For International Preliminary Examining Authority use only

- | received | not received |
|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |

The demand is also accompanied by the item(s) marked below:

- | | |
|--|---|
| 1. <input checked="" type="checkbox"/> fee calculation sheet | 4. <input type="checkbox"/> statement explaining lack of signature |
| 2. <input type="checkbox"/> separate signed power of attorney | 5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form |
| 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: | 6. <input type="checkbox"/> other (<i>specify</i>): |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

KELDA CAMILLA KAREN STYLE
Professional Representative

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply. ☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only


Demand received from IPEA on:

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

14

Applicant's or agent's file reference 101636/KCS/DG		FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP00/04231	International filing date (day/month/year) 09/05/2000	Priority date (day/month/year) 04/06/1999	
International Patent Classification (IPC) or national classification and IPC H04Q7/38			
Applicant NOKIA NETWORKS OY et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 4 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none">I <input checked="" type="checkbox"/> Basis of the reportII <input type="checkbox"/> PriorityIII <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicabilityIV <input type="checkbox"/> Lack of unity of inventionV <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statementVI <input type="checkbox"/> Certain documents citedVII <input checked="" type="checkbox"/> Certain defects in the international applicationVIII <input type="checkbox"/> Certain observations on the international application			
Date of submission of the demand 03/10/2000		Date of completion of this report 22.08.2001	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer Kreppel, J Telephone No. +49 89 2399 8246	



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/04231

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):
- Description, pages:**

1,3-15	as originally filed		
2	as received on	21/07/2001	with letter of 19/07/2001

Claims, No.:

1-21	as received on	21/07/2001	with letter of 19/07/2001
------	----------------	------------	---------------------------

Drawings, sheets:

1/3-3/3	as originally filed
---------	---------------------

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP00/04231

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	10,11,20,21
	No:	Claims	1-9,12-19
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-21
Industrial applicability (IA)	Yes:	Claims	1-21
	No:	Claims	

- 2. Citations and explanations**
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

With respect to item V:

- 1 The following documents (D) are referred to in this communication; the numbering will be adhered to in the rest of the procedure:

D1: WO 99 27741 A (ERICSSON TELEFON AB L M) 3 June 1999 (1999-06-03)

- 2 Document **D1**, which is regarded to represent the closest prior art to the subject-matter of **claim 1**, relates to a move-over procedure for a CDMA base mobile telecommunications system wherein diversity connections and soft-handover are used. Different Mobile Switching Centers (MSC) and Radio Network Controllers (RNC) are involved into a move-over of the diversity handling function as shown in figures 11 to 12C. After having switched the diversity handling function from a first RNC to a second RNC, the connection might be switched via another MSC thus eliminating the old MSC and RNC from the connection path.

Hence, document D1 discloses, according to the features of claim 1, a network element (figure 12, 122₁) for use in a communication network, said network element being arranged between a mobile station (figure 12: MS) and an end element (figure 12: 124₂), wherein connections are established between said mobile station and said end element via said network element (fig. 12: 132), said network element comprising means for determining if the connection between said end element and said end station is to be released (fig. 12C; page 27, lines 3-11).

The subject-matter of claim 1 is therefore not novel (Article 33(2) PCT).

The scope of present claim 1 is so broad that also a call release procedure initiated by a mobile terminal, detected by a Mobile Switching Center sending an ISUP release message to an interoffice exchange could be considered as falling within the scope of claim 1.

- 3 Independent **claim 19** relates to a network comprising a network element as defined in any of claims 1 to 18. Such a network element is already known from

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP00/04231

document D1 (see the comments and citations regarding claim 1). As already explained above, document D1 discloses also a network comprising an end element and a mobile station.

The subject-matter of claim 19 is therefore not novel (Article 33(2) PCT).

- 4 Dependent **claims 2 to 18, 20 and 21** do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty or inventive step for the following reasons:

- 4.1 The subject-matter of dependent **claims 2 to 9 and 12 to 18** is already known from document D1.

claims 2-8: figure 14; page 28, line 6 to page 30, line 21;
claim 9: figure 9: 9-4; page 20, line 20 to page 21, line 9;
claim 12-17: page 6, lines 14-20;
claim 18: figure 13: 122₁.

The subject-matter of claims 2 to 9 and 12 to 18 is therefore not novel (Article 33(2) PCT).

- 4.2 Dependent **claims 10, 11, 20 and 21** relate to further design details and arrangements of the end station, the end element and the network which are obvious for a person skilled in the art. The subject-matter of claims 10, 11, 20 and 21 is therefore not based on an inventive step (Article 33(3) PCT).

With respect to item VII:

- 1 Independent **claims 1 and 19** are not in the two-part form recommended by Rule 6.3(b) PCT having a pre-characterizing portion which correctly reflects the prior art of document D1.
- 2 The relevant background art disclosed in document D1 is not taken into account

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP00/04231

within the opening part of the description (Rule 5.1 a) ii) and iii) PCT).

- 3 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
- 4 Claim 20 should apparently be dependent on claim 19 (and not 19 or 20). Claim 21 should be dependent on claims 19 or 20 (and not 19, 20 or 21).

core network is unable to predict the traffic which is to be transmitted between the core network and the mobile station and vice versa.

- 5 It has been proposed that a timer mechanism be used by the core network in order to control the release of the connection. For example, if a packet of data has not been received for X seconds, then the connection is released.
- 10 This method has the problem that the core network may not release this connection at an appropriate time. This is because the core network is not aware of parameters of the radio network controller or the mobile station which might indicate that an earlier break in the connection was
- 15 appropriate. This may result in connections being maintained longer than required. This unnecessarily uses up resources within the network, which may reduce the amount of traffic which can be supported.

20 **Summary of the Invention**

It is an aim of embodiments of the present invention to address this problem.

- 25 According to one aspect of the present invention, there is provided a network element for use in a communications network, said network element being arranged between an end station and an end element, wherein connections are established between said end station and said end element
- 30 via said network element, said network element comprising means for determining if the connection between said end element and said end station is to be released.

CLAIMS:

1. A network element for use in a communication network,
said network element being arranged between an end station
5 and an end element, wherein connections are established
between said end station and said end element via said
network element, said network element comprising means for
determining if the connection between said end element and
said end station is to be released.

10

2. A network element as claimed in claim 1, wherein said
network element is arranged to release said connection when
the determining means determines that the connection is to
be released.

15

3. A network element is claimed in claim 2, wherein said
network element is arranged to release the connection
between the network element and said end station.

20 4. A network element as claimed in claim 2 or 3, wherein
said network element is arranged to send a message to the
end element indicating that said connection has been
released.

25 5. A network element as claimed in claim 1, wherein said
network element is arranged to send a request for the
connection to be released to said end station.

30 6. A network element as claimed in claim 5, wherein the
end element sends a connection release command to said
network element in response to the release request received
by said network element, said network element controlling
the release of said connection.

7. A network element as claimed in claim 6, wherein said network element is arranged to send a release request to said end station in response to the release command received
5 from said end element.

8. A network element as claimed in claim 7, wherein said network element is arranged to send a message to said end element advising that the connection has been released.
10

9. A network element as claimed in any preceding claim, wherein said determining means determines that the connection is to be released if the connection has not been used for a predetermined time.
15

10. A network element as claimed in claim 9, wherein the predetermined time depends on the type of traffic for which the connection is intended.

20 11. A network element as claimed in claim 9, wherein the predetermined time depends on the quality of service profile of the traffic for which the connection is intended.

12. A network element as claimed in any preceding claim,
25 wherein said determining means is arranged to determine if the connection is to be released based on the state of the end station.

13. A network element as claimed in any preceding claim,
30 wherein said determining means is arranged to determine if the connection should be released based on the movement of the end station.

14. A network element as claimed in claim 13, wherein the amount of updating information received in a given time from the end station is used as a measure of the movement of the end station.

5

15. A network element as claimed in claim 14, wherein said updating information comprises URA updates.

16. A network element as claimed in any preceding claim,
10 wherein said determining means is arranged to determine if the connection should be released based on the location of said end station.

17. A network element as claimed in claim 16, wherein said
15 determining means determines that the connection should be released if the end station is associated with a different network element.

18. A network element as claimed in any preceding claim,
20 wherein said network element is a radio network controller.

19. A network comprising a network element as claimed in any preceding claim, an end station and an end element.

25 20. A network as claimed in claim 19, wherein said end station is a mobile station.

21. A network element as claimed in claims 19 or 20,
wherein said end element is a SGSN.

30

22. A network as claimed in claims 19, 20 or 21 wherein said network operates in accordance with the UMTS Standard.

RELEASING A CONNECTION IN A WIRELESS COMMUNICATION NETWORK**Field of the Invention**

5 The present invention relates to a network element for use in a communications network. In particular, but not exclusively, the network element is a radio network controller in a code division multiple access wireless cellular communications network.

10

Background of the Invention

The use of code division multiple access (CDMA) is being proposed for the next generation of cellular
15 telecommunication networks. Additionally, code division multiple access is also being used in the IS-95 standard in the USA. CDMA is a direct sequence spread spectrum technique. In a wireless cellular network using CDMA, the
20 mobile stations in one cell associated with a first base station will use the same frequency as mobile stations in an adjacent cell associated with the second base station. The different mobile stations can be distinguished by the respective base stations as each mobile station will be using a different spreading code.

25

In one of the new CDMA standards which is currently being proposed, connections are made between a mobile station to a base station, from the base station to a radio network controller and from the radio network controller to a core
30 network. The core network is arranged to control the establishment and release of connections between the mobile station and the core network. With "bursty" traffic which consists of packets of data which are sent irregularly, the

core network is unable to predict the traffic which is to be transmitted between the core network and the mobile station and vice versa.

- 5 It has been proposed that a timer mechanism be used by the core network in order to control the release of the connection. For example, if a packet of data has not been received for X seconds, then the connection is released.
- 10 This method has the problem that the core network may not release this connection at an appropriate time. This is because the core network is not aware of parameters of the radio network controller or the mobile station which might indicate that an earlier break in the connection was
- 15 appropriate. This may result in connections being maintained longer than required. This unnecessarily uses up resources within the network, which may reduce the amount of traffic which can be supported.

20 **Summary of the Invention**

It is an aim of embodiments of the present invention to address this problem.

- 25 According to one aspect of the present invention, there is provided a network element for use in a communications network, said network element being arranged between an end station and an end element, wherein connections are established between said end station and said end element
- 30 via said network element, said network element comprising means for determining if the connection between said end element and said end station is to be released.

Brief Description of the Drawings

For better understanding of the present invention and as to how the same may be carried into effect, reference will now be made by way of example to the accompanying drawings in which:-

Figure 1 shows a cellular telecommunication network in which embodiments of the present invention can be incorporated;

10 Figure 2A shows a mobile station in communication with two base stations under the control of a single radio network controller;

Figure 2B shows a mobile station in communication with two base stations, each of which is connected to a different
15 radio network controller;

Figure 3A shows the connection before the serving radio network controller is changed;

Figure 3B shows the connections after the serving radio network controller has been changed;

20 Figure 4 shows the various radio resource control modes;

Figure 5 shows a first embodiment of the present invention; and

Figure 6 shows a second embodiment of the present invention.

25 Detailed Description of Embodiments of the Present Invention

Reference will first be made to Figure 1 in which three cells 2 of the cellular telecommunications network are shown. Each cell 2 is served by a respective base transceiver station (BTS) 4. The base station is sometimes
30 called node B in CDMA systems. Each base transceiver station is arranged to transmit signals to and receive signals from the mobile stations 6 located in the cell

associated with the given base transceiver station 4. Likewise, each mobile station 6 is able to transmit signals to and receive signals from the respective base transceiver station 4.

5

The cellular telecommunications network shown in Figure 1 uses a code division multiple access technique.

With the proposed new CDMA standard, macro diversity is possible. This means that a mobile station can be connected to more than one radio network controller RNC at the same time. However, as far as the core network is concerned, these connections are controlled by one radio network controller which is defined as the serving radio network controller SRNC. This serving radio network controller SRNC communicates with a third generation serving GPRS support node 3G-SGSN. This serving GPRS support node is analogous to that of the GPRS standard used in conjunction with the GSM standard but has been modified so as to be usable with the CDMA standard.

Reference is made to Figure 2A. In Figure 2A, a mobile station 6 is in communication with two base stations 4a and 4b. Each of these base stations 4a and 4b is connected to the same radio network controller RNC 10a. The common radio network controller 10a is thus the serving radio network controller and is connected to the core network 12. This core network 12 is represented by the dashed line and is the part of the network upstream of the serving radio network controller. The serving radio network controller 10a is in fact connected to the third generation serving GPRS support node 3G-SGSN 14 of the core network 12.

Reference is now made to Figure 2B which shows the mobile station 6 connected to two base stations 4c and 4d. However, unlike in Figure 2A, one base station 4c is connected to one radio network controller 10c whilst the other base station 4d is connected to a second radio network controller 10b. One of these radio network controllers acts as the serving radio network controller SRNC 10b. In the embodiment shown in Figure 2B, the second radio network controller 10b acts as the serving radio network controller.

10 The other radio network controller 10c is defined as being a drift radio network controller DRNC. The drift radio network controller 10c is connected to the serving radio network controller 10b. The serving radio network controller 10b is, as in the arrangement shown in Figure 2A, connected to the SGSN 14. In the arrangement shown in Figure 2A, the drift radio network controller and the serving radio network controller are the same radio network controller.

20 The serving radio network controller 10a or b is able to combine information received from the mobile station 6 via the two different base stations 4a-d, regardless of whether or not the base stations are connected to the same radio network controller or different radio network controllers.

25 In the latter situation, the drift radio network controller 10c would forward information from the respective base station 4c to the serving radio network controller 10b. The serving radio network controller 10b also copies information which is intended for a given mobile station 6 to the relevant drift radio network controller 10c so that the base station 4c connected to the serving radio network controller 10b as well as the base station connected to the drift radio

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network controller 10c can be transmit the same information, where appropriate, to the mobile station 6.

The serving radio network controller SRNC is arranged to control the information transfer and request for radio resources from the appropriate drift radio network controllers DRNC. The drift radio network controllers only relay information between the mobile station and the serving radio network controller SRNC.

It is preferred that the same serving radio network controller SRNC be used for packet switched traffic (i.e. data transmitted in packet form) and circuit switched traffic i.e. speech.

When a mobile station moves, the base station or base stations with which the mobile station is in communication needs to change. This may mean that a different serving radio network controller may be required. This is described in relation to Figures 3A and 3B. In the arrangement shown in Figure 3A, the mobile station 6 is in communication with a single base station 4. This base station 4 is connected to the drift radio network controller 10c. The drift radio network controller is connected to the serving radio network controller 10b, as shown in Figure 2B. The serving radio network controller is connected to the current SGSN 14 which is in turn connected to the gateway GPRS serving node 16. Accordingly, signals to and from the mobile station follow the following path: mobile station 6 to the base station 4c connected to the drift RNC 10c, to the drift RNC 10c, from the drift RNC 10c to the serving RNC 10b, from the serving RNC 10b to the current SGSN 14 and from the current SGSN 14

to the GGSN 16. The same path is used for signals from the GGSN 16 to the mobile station 6, but in reverse.

The SGSN 14 also has a connection to a home location register 18. Each radio network controller 10b and 10c is connected to respective 3G mobile services switching centres 20a and 20b. The drift radio network controller 10c is connected to a different serving GPRS support node 22, which is not in use in this mode. There is also a connection between the home location register 18 and the third generation mobile services switching center 20a connected to the serving radio network controller 10b.

Reference is now made to Figure 3B which shows the connections which are established once the serving radio network controller has changed. In this arrangement, the drift radio network controller 10c becomes the serving radio network controller. The serving radio network controller 10b may become a drift radio network controller or may not be involved in communications with the mobile station 6. The mobile station continues to send and receive signals from the base station 4c connected to the new serving radio network controller 10c. The new serving radio network controller 10c has established a connection with the SGSN 22 to which it is connected. Signals from the serving GPRS node 22 connected to the new serving radio network controller 10c are passed to the GGSN 16. A connection is established between the home location register HLR 18 and the mobile services switching centre 20b connected to the new serving radio network controller 10c. A connection is also established between the home location register 18 and the SGSN 22 connected to the new serving radio network controller 10c.

This relocation procedure takes place when the target radio network controller (i.e. a drift radio network controller) is controlling all of the communications to and from the mobile station. In other words, the serving radio network controller does not communicate with the mobile station with any of the base stations which it controls.

The connection between the mobile station 6 and the GGSN 16 is now via the base station 4c, the new serving radio network controller 10c, and the new SGSN 22.

Radio resource control provides the common control and signalling between the radio network controller and the mobile station. The same radio resource control connection is used both by speech and packet data traffic. The radio resource control (RRC) modes are illustrated schematically in Figure 4. In the RRC-idle mode 30, there is no connection established between the mobile station and the universal mobile telecommunications system terrestrial radio access network (UTRAN). UTRAN is the combination of RNC(s) and BTS(s). If the user equipment is attached to the network, but in RRC-idle mode (which implies that the mobile is not in active communication), the location is tracked by the SGSN. In this mode, there is no signalling between the UTRAN and the mobile station except for system information that is sent from the network downlink on a broadcast channel to the user equipment. The user equipment can also receive paging messages in this mode. No information on the mobile station is stored in the UTRAN in this state.

In the connected mode 32, the main states are the cell connected state 34 and the UTRAN Registration Area (URA)

connected state 36. One radio network controller will be acting as the serving radio network controller and a radio resource control connection is established between the mobile station and the serving radio network controller.

5 When the position of the mobile station is known on the cell level, the mobile station is in the cell connected state. The radio resource control connection mobility is handled by hand over procedures. In this state, the radio link may be use different channels:-

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1. Dedicated Channel (DCH). In this channel, a spreading code is allocated to the mobile station and is solely used by that mobile station.

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2. Dedicated Shared Channel (DSCH). In this channel, a spreading code is shared amongst a number of mobile stations. The radio channel is optimised for packet traffic.

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3. Common Channel on the downlink and Random Access Channel on the uplink. These are common channels and are suitable for use with short packets.

When the mobile position is known only on the URA level, i.e. which group of cells it is in, the mobile station is in the URA connected state. The URA comprises a set of cells of the network. In other words, the mobile station is in one of a plurality of cells which together define the URA. The URA updating procedures provide the mobility functioning. Paging is performed for downlink packet transfer.

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A radio access bearer represents the connection between the SGSN and the mobile station. The radio access bearer comprises two branches. The first branch is the GTP (GPRS tunnelling protocol) tunnel between the radio network controller and the SGSN. The second branch is between the mobile station and the radio network controller. Between one mobile station and the SGSN, there are as many radio access bearers as there are PDP (packet data protocol) context activated when a radio access bearer is established.

10 A radio resource control connection is established between the mobile station and the radio network controller, for signalling. However, no radio access bearer may be established. A radio access bearer is established only when the connection between the radio network controller and the

15 SGSN is also established.

Reference is now made to Figure 5. In this arrangement inside the radio network controller 50, a process determines that the RRC connection of a particular mobile station should be released to optimise the use of resources. By releasing the connection which otherwise uses unnecessary signalling, the radio resources of the network are conserved, thus improving capacity and/or quality. The radio network controller 50 therefore sends an Iu release request 54 to the SGSN 52. Iu is the interface between the radio network controller and the SGSN 52. The request sent to the SGSN 52 indicates the reason why the bearer should be released. In the embodiments of the invention, the connection may be broken in order to optimise resources.

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30 This will be described in more detail hereinafter.

It is known to release the connection if the operation and maintenance controller of the network has intervened and

wants the connection to be broken or if there is equipment failure at some point between the mobile station and the SGSN 52.

5 The SGSN 52 decides whether or not to confirm the request for the release of the radio bearer. If the SGSN 52 agrees that the connection should be broken, a release command 56 is sent to the radio network controller 50 via the Iu interface.

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If the radio resource connection between the radio network controller 50 and the mobile station 58 has not already been released, the radio network controller sends a radio resource control connection release message 60 to the mobile station. The mobile station releases the connection and sends a radio resource control connection released message 62 to the radio network controller 50. The radio network controller 50 then sends a confirmation 59 that the connection has been released to the SGSN 52 on the Iu interface.

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Reference is now made to Figure 6 which shows an alternative embodiment to that shown in Figure 5. In the embodiment shown in Figure 6, the radio network controller 50 does not send a release request to the SGSN 52. Instead, the RNC 50 sends a release radio connection message 64 to the mobile station 58. The mobile station sends an acknowledgement message 66 to the radio network controller 50 and the connection therebetween is broken. The radio network controller 50 then advises the SGSN 52 via the Iu interface that the connection has been released. The SGSN 52 then releases all of the Iu connections. This alternative signalling is applicable particularly if there is no need of

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confirmation from the SGSN. The RNC process which triggers the signalling procedure shown in Figure 5 or 6, should make the decision to release the RRC connection of a particular mobile station based (among other things) on the quality of service profile of the radio access bearer established. The process may only release the RRC connection, if the quality of service profile indicates that this bearer(s) are used for bursty traffic between the SGSN 52 and the mobile station 58. This type of traffic is indicated by the traffic class parameter.

One class of traffic is referred to background traffic whilst the other type of traffic is interactive traffic. Background traffic is, for example message traffic which is not time sensitive whilst interactive traffic is, for example traffic resulting in web browsing. With both of these types of traffic, the SGSN is unable to predict when and what traffic is to be forwarded to the mobile station and likewise when and what traffic is going to be received from the mobile station. The radio network controller carries out a process to control the release of the bearer for one or more of the following reasons:

1. The radio network controller has a timer which measures the time since the last packet was transferred to or received from the mobile station. If a given time lapses without a packet being transferred, then the radio network controller releases the connection. Different times may be used depending on the quality of services profile, in particular whether or not the traffic is interactive or background traffic. A shorter time may be provided for background traffic.

2. The radio network controller can take into account the radio state of the mobile station. For example, the RNC may release the RRC connection only in the URA connected mode.

5 3. The connection may be kept when another radio bearer is established, for example from the mobile switching centre to the mobile station via the radio network controller. The reason is that the RNC has to keep this mobile RRC-connected for this circuit switched connection, so that it can
10 maintain the radio access bearer for a packet connection without using additional resources.

4. The radio network controller can take into account the movement of the mobile station. If the mobile station is
15 moving above a given speed, the bearer connection may be released. A fast moving mobile station uses up a relatively large amount of radio resources for updates (e.g. URA updates). The radio network controller could set a maximum number of URA updates, for example 10 and if no user data
20 traffic has been received within that time, the connection could be released. This is an elegant way to take into account the mobile movement.

5. The radio network controller may release the connection
25 if the mobile station enters an area controlled by a different radio network controller. In this regard, reference is made to Figures 3a and 3b.

As mentioned hereinbefore, a combination of these methods
30 may be used for determining if a radio network controller should release the bearer. For example, if a mobile station, which is in the URA update state enters a new radio network controller area, the serving radio network

controller can be arranged to release the radio bearer. This may in turn trigger a routing area update from the mobile station. The routing area update is used by mobile to inform the SGSN of its location in RRC-idle mode.

5 If the bearer is released the internal resources of the radio network controller can be conserved. For example, each time a connection is established, the radio network controller requires some buffer resource to be allocated thereto. If a connection is not being used, the buffer
10 resource may be wasted.

In another example, if a mobile station has a circuit switch connection i.e. speech connection, the radio network controller could keep the packet bearer established longer
15 than otherwise. This is because a user is more likely to transfer data during or after a call and the radio network controller would merely have to re-establish that bearer otherwise.

20 In one modification of the embodiments described hereinbefore, the SGSN could be arranged to give an indication in the bearer set up procedure to the radio network controller whether or not the radio network controller is permitted to suggest the release of the
25 bearer. Rules associated with this may also be transferred from the SGSN to the radio network controller. Those rules may take any suitable form. The indication in the bearer set up may be implicitly derived by the radio network controller from quality of service parameters provided by
30 the SGSN to the radio network controller.

The SGSN could indicate the timer value, or indicate not to release RRC connection if a bearer with particular quality

of service profile is established. The SGSN can thus instruct the RNC as to how it should interpret the rules which it has for determining when to release a connection.

- 5 Whilst the present invention has referred to mobile stations, it should be appreciated that embodiments of the present invention are applicable to other types of user equipment, for example computer terminals. These computer terminals may be fixed or mobile.

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- Embodiments of the present invention have been described in the context of a code division multiple access system. It should be appreciated that embodiments of the present invention can be used with any other suitable spread
15 spectrum access technique, frequency division multiple access techniques, time division multiple access technique or hybrids thereof.

CLAIMS:

1. A network element for use in a communication network,
said network element being arranged between an end station
5 and an end element, wherein connections are established
between said end station and said end element via said
network element, said network element comprising means for
determining if the connection between said end element and
said end station is to be released.

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2. A network element as claimed in claim 1, wherein said
network element is arranged to release said connection when
the determining means determines that the connection is to
be released.

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3. A network element is claimed in claim 2, wherein said
network element is arranged to release the connection
between the network element and said end station.

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4. A network element as claimed in claim 2 or 3, wherein
said network element is arranged to send a message to the
end element indicating that said connection has been
released.

25

5. A network element as claimed in claim 1, wherein said
network element is arranged to send a request for the
connection to be released to said end station.

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6. A network element as claimed in claim 5, wherein the
end element sends a connection release command to said
network element in response to the release request received
by said network element, said network element controlling
the release of said connection.

7. A network element as claimed in claim 6, wherein said network element is arranged to send a release request to said end station in response to the release command received from said end element.

8. A network element as claimed in claim 7, wherein said network element is arranged to send a message to said end element advising that the connection has been released.

9. A network element as claimed in any preceding claim, wherein said determining means determines that the connection is to be released if the connection has not been used for a predetermined time.

10. A network element as claimed in claim 9, wherein the predetermined time depends on the type of traffic for which the connection is intended.

11. A network element as claimed in claim 9, wherein the predetermined time depends on the quality of service profile of the traffic for which the connection is intended.

12. A network element as claimed in any preceding claim, wherein said determining means is arranged to determine if the connection is to be released based on the state of the end station.

13. A network element as claimed in any preceding claim, wherein said determining means is arranged to determine if the connection should be released based on the movement of the end station.

14. A network element as claimed in claim 13, wherein the amount of updating information received in a given time from the end station is used as a measure of the movement of the end station.

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15. A network element as claimed in claim 14, wherein said updating information comprises URA updates.

16. A network element as claimed in any preceding claim, wherein said determining means is arranged to determine if the connection should be released based on the location of said end station.

17. A network element as claimed in claim 16, wherein said determining means determines that the connection should be released if the end station is associated with a different network element.

18. A network element as claimed in any preceding claim, wherein said network element is a radio network controller.

19. A network comprising a network element as claimed in any preceding claim, an end station and an end element.

20. A network as claimed in claim 19, wherein said end station is a mobile station.

21. A network element as claimed in claims 19 or 20, wherein said end element is a SGSN.

30

22. A network as claimed in claims 19, 20 or 21 wherein said network operates in accordance with the UMTS Standard.

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Fig.1.

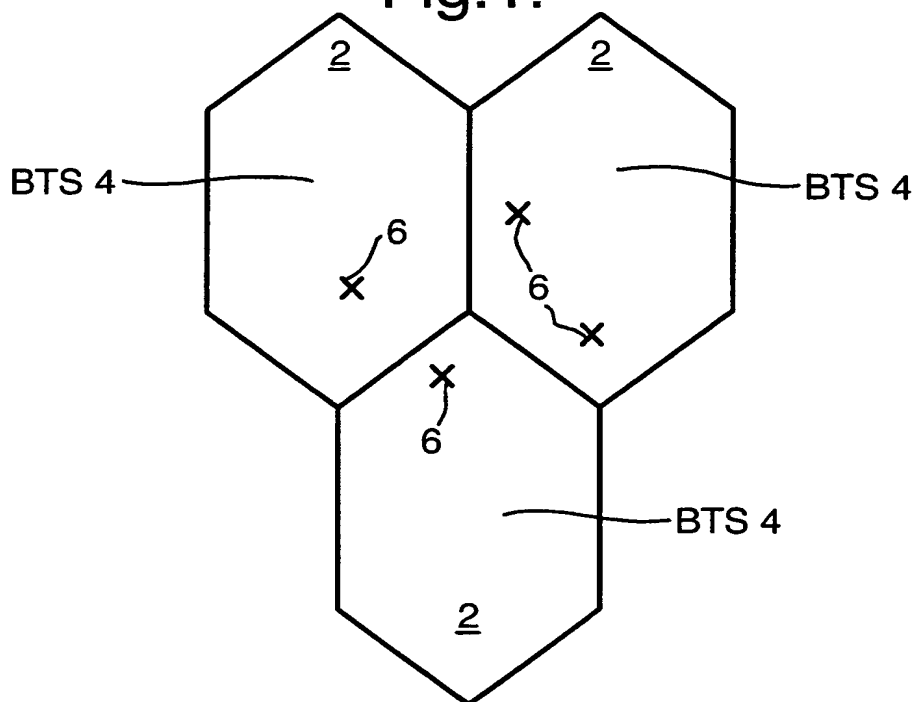


Fig.2A.

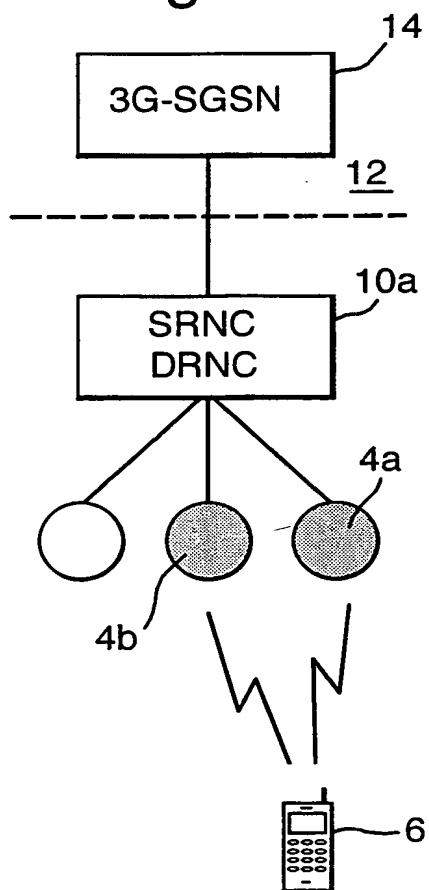
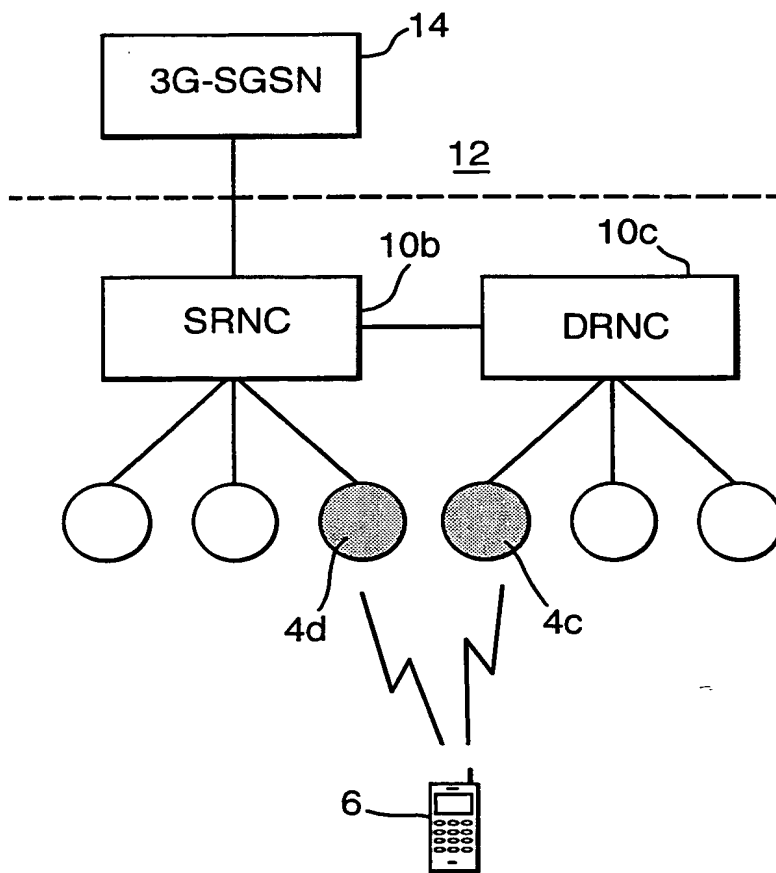


Fig.2B.



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Fig.3A.

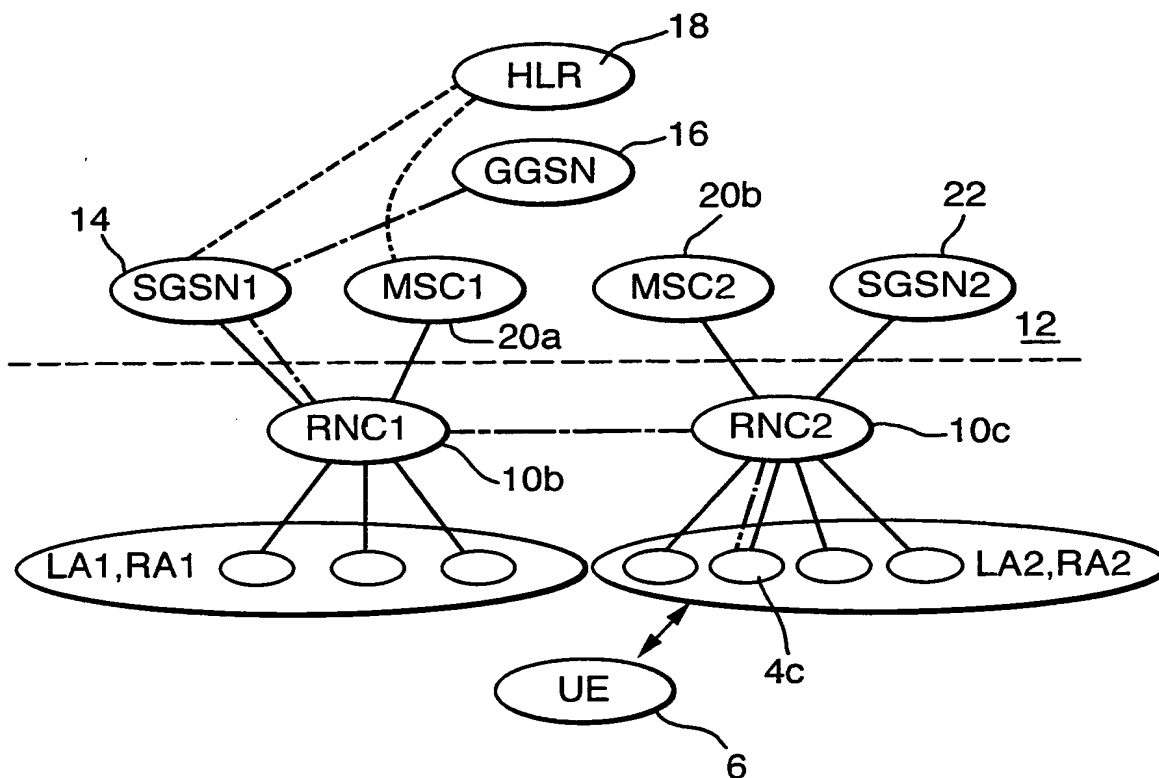
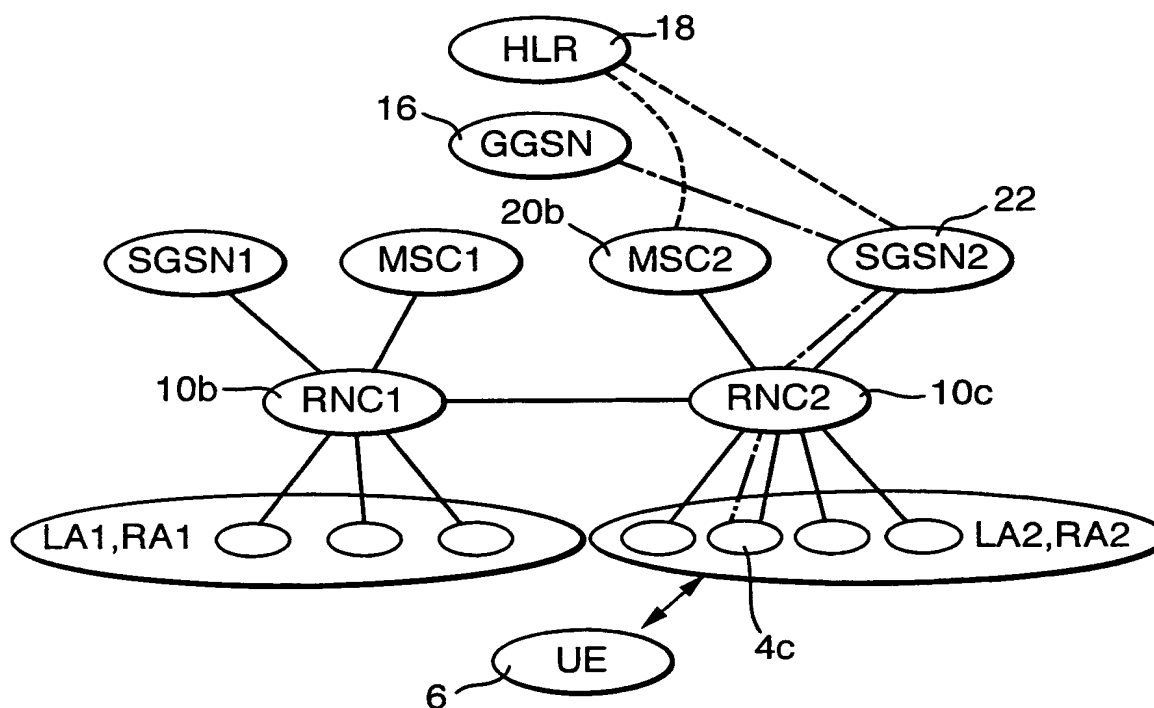


Fig.3B.



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Fig.4.

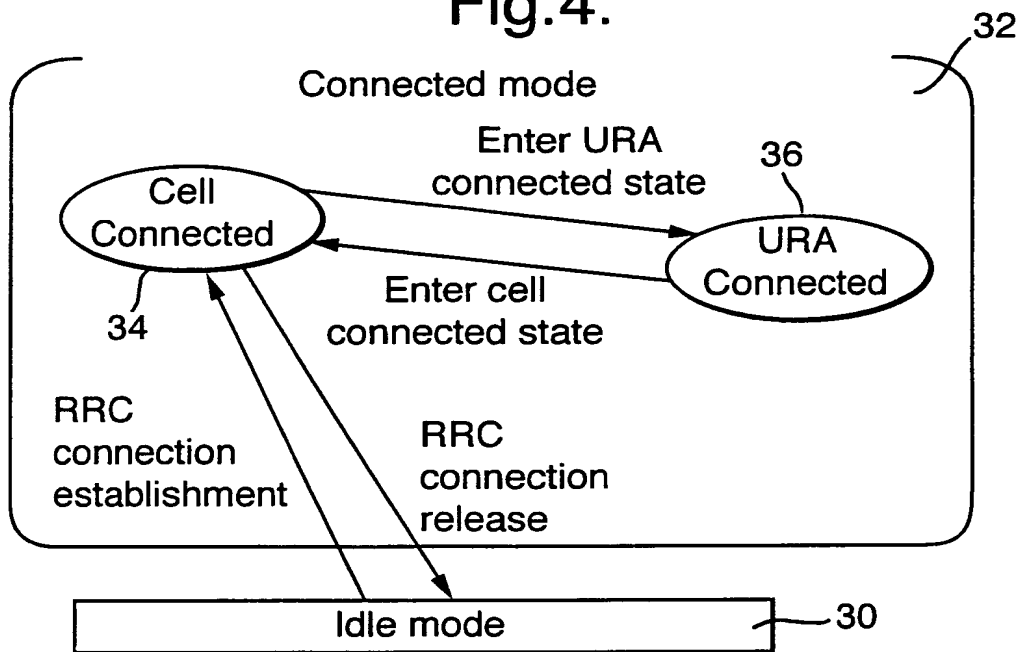


Fig.5.

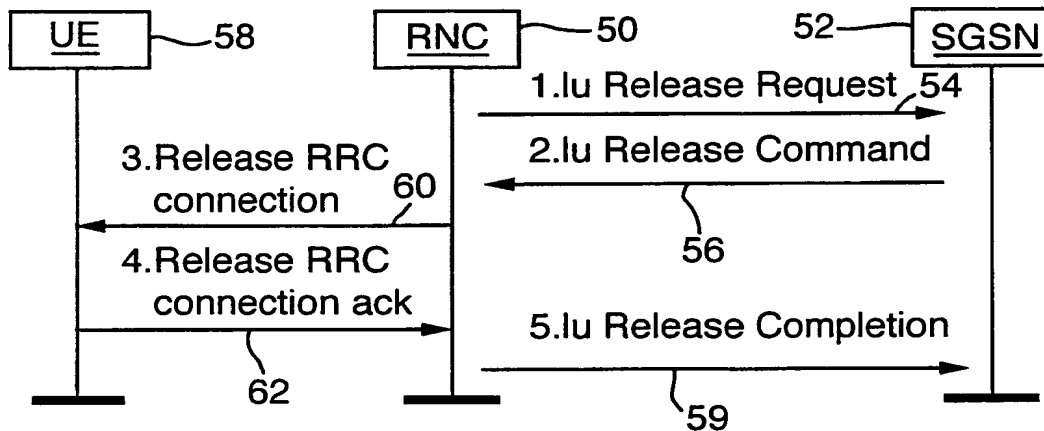
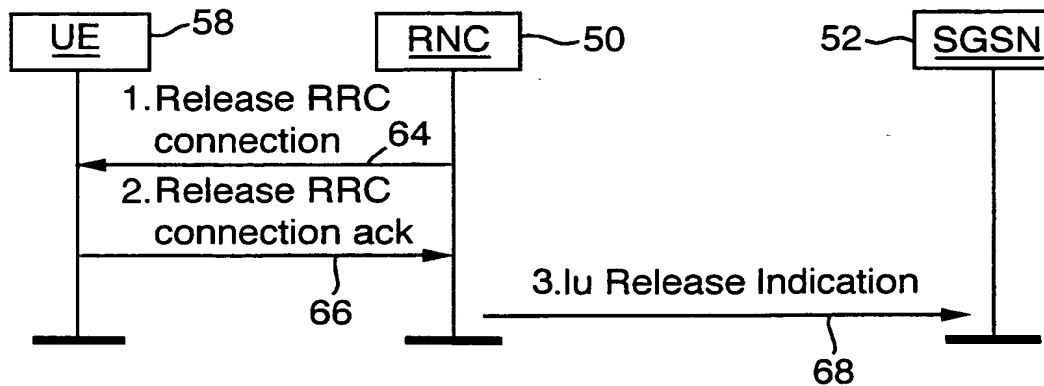


Fig.6.



INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/04231

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04Q7/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	EP 0 568 212 A (NOKIA MOBILE PHONES LTD) 3 November 1993 (1993-11-03)	1-3, 16, 17, 19, 20
Y	column 4, line 34 - column 5, line 28 ---	4
Y	EP 0 888 022 A (LUCENT TECHNOLOGIES INC) 30 December 1998 (1998-12-30)	4
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	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the international search

15 August 2000

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/04231

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